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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/628,929	07/28/2000	Joe Cargnelli	9351-21/HSF	3626
1059	7590	09/20/2005	EXAMINER	
BERESKIN AND PARR 40 KING STREET WEST BOX 401 TORONTO, ON M5H 3Y2 CANADA			FORD, JOHN K	
			ART UNIT	PAPER NUMBER
			3753	

DATE MAILED: 09/20/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/628,929

Applicant(s)

CARGNELLI ET AL.

Examiner

John K. Ford

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 7/7/05.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1, 2, 4, 6-9, 19-33 is/are pending in the application.
- 4a) Of the above claim(s) 21-28, 30-33 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1, 2, 4, 6-9, 19 and 29 is/are rejected.
- 7) ☒ Claim(s) 20 is/are objected to (if 112 problem in claim 1 is overcome).
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date \_\_\_\_\_
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

Applicant's response of July 7, 2005 has been carefully considered. While the Examiner viewed independent claims 1 and 27 as found in the amendment of September 17, 2004 as substantially co-extensive in scope (claiming the humidification of a process gas stream to a fuel cell), that is no longer the case. Claim 1 has been amended, in pertinent part, to claim a common coolant supply for the first and second heat exchangers and removing heat from them using this common coolant supply. The Examiner agrees that this is not taught by the prior art, in so far as claim 20 is concerned.

On the other hand, claim 27 has gone through a substantial rewrite and now claims two systems for delivering fuel and oxidant to the fuel cell, never previously claimed. As stated above both claims 1 and 27, up to this juncture, have claimed a process for conditioning one process gas (of no particular composition) and now claim separate steps for conditioning both fuel and oxidant in at least partially separate disclosed systems (see applicant's Figure 7). Applicant elected, by original presentation, the process for conditioning a process gas of no particular composition and having received several actions on the merits to that particular process, the Examiner is not permitting a switch of invention at this late juncture to a process for conditioning two separate reactants (fuel and oxidizer) in a newly presented claim drawn to such a method.

Newly submitted amended claims 27, 28 and 31-33 are directed to an invention that is independent or distinct from the invention originally claimed for the following reasons: See above explanation.

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Since applicant has received an action on the merits for the originally presented invention, this invention has been constructively elected by original presentation for prosecution on the merits. Accordingly, claims 27, 28 and 31-33 are withdrawn from consideration as being directed to a non-elected invention. See 37 CFR 1.142(b) and MPEP § 821.03.

In addition, claim 30 is withdrawn because it depends from non-elected claim 21 (as discussed in the previous office action, please caption it "withdrawn").

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

Claims 1, 2, 4, 6-9, 19, 20 and 29 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claim 1, it states that the excess heat from the first and second heat exchangers is removed with the common coolant supply. This is not strictly speaking true. The heat from the first heat exchanger (118) is removed by an intermediate fluid (circulated by pump 136) and then transfers that heat to a further heat exchanger (134) that is cooled by a "common coolant" circulated between further heat exchanger (134) and yet another further heat exchanger 164 (the latter connected to cool another intermediate fluid circulating between it and second heat exchanger 126). It is deemed mis-descriptive to claim in claim 1 that first and second heat exchangers (118 and 126) are cooled by a common coolant when they are in fact **each cooled by a separate**

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coolant that are, in turn, cooled by a common coolant in a separate set of heat exchangers (134 and 164).

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 2, 4, 6-9, 19 and 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over the combined teachings of JP 5-256468, Weitman, Getchel et al (USP 6,415,858), and either Fleck and/or applicant's admitted prior art.

JP' 468 teaches a stream source 24 connected to a mixing chamber 20 for mixing the injection steam with incoming process gas for compressor 23. This highly saturated process gas is subsequently cooled below its dew-point by cooler 25 and a separator 28 discharges condensate. A heater 31 subsequently is used to heat the process stream to a desired temperature. One additional refinement of JP' 468 is the use of a humidity controller 30 (controlled by a dew-point instrument 29) downstream of the saturating cooler 25. In view of the teaching of Weitman, which shows a saturator followed by a reheater and which lacks the refinement discussed above (i.e. the use of a humidity controller 30 by a dew-point instrument 29), it would have been obvious to have omitted the dew-point instrument 29 and controller 30 in JP' 468 to attain a less

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expensive structure. In general, the omission of an element and its associated function is not deemed to be patentable, In re Karlson, 136 USPQ 184.

Alternatively, to have replaced saturator unit 1 of Weitman with units 20, 24 and 25, 27 & 28 of JP' 468, which perform the same function, would have been obvious to reduce the overall size of the saturation section, and advantageously permit high temperature saturation to take place (i.e. by the use of steam).

Regarding the step of providing a gas of controlled humidity and temperature to a fuel cell, it is submitted that it is well known in the art of fuel cells to control temperature and humidity of the process gas (typically air) to a predetermined level to assure maximum efficiency as taught by Fleck. Fleck also teaches that where the system is exposed to freezing temperatures it can be provided with "suitable insulating measures or by a heating system." (col. 3, lines 28-34). To have insulated all of the conduits in Weitman/JP' 468 to prevent freezing problems when using them to supply the process air of controlled temperature and humidity to a fuel cell would have been obvious to one of ordinary skill.

Likewise, Applicant also admits in his remarks of July 20, 2004, page 8, that fuel cells must be precisely conditioned to operate properly. With regard to fuel cells applicant admits that they need precisely controlled temperature and humidities to operate properly (July 20, 2004 remarks, page 8):

"It is commonly necessary for the temperature and humidity conditions to be very tightly controlled, since small variations in temperature and humidity can adversely affect fuel cell performance; more importantly, improper temperature and humidity

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conditions can result in damage to the fuel cell and/or to flooding leading to a drastic reduction in performance.”

Also see applicant’s specification page 2, lines 10-13, incorporated here by reference.

In view of either Fleck and/or applicant’s own admissions, it would have been obvious to have used the JP’ 468/Weitman combined prior art to condition a fuel cell because both JP’ 468 and Weitman are concerned with generating precisely controlled temperatures and humidities in process fluids. Admittedly, neither JP’ 468 nor Weitman explicitly contemplate bringing the precisely regulated process gas to a fuel cell, but Fleck and applicant have, respectively, disclosed and admitted that fuel cells need precisely controlled temperatures and humidities in the process fluids (e.g. air and gaseous fuel) to function properly.

Against this reality, applicant argues in the July 20, 2004 response that there is some fundamental difference between precisely controlling humidity and temperature in gas (air) delivered to a clean room versus the gas (air) delivered to a fuel cell. The Examiner disagrees. There is no difference. Both systems need precisely controlled temperatures and humidities, applicant’s remark to the contrary notwithstanding. Moreover, the speed at which the system responds to changes in temperature and humidity simply isn’t an issue given that none of the applicant’s claims set any limitation on this performance criterion. Moreover, the arguments about “dead volumes” is simply incommensurate with the scope of the claims given that no limits are set on “dead volume” in any of applicant’s claims. The fact that saturating air with water vapor and

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then cooling it below its dew-point inherently cleans the air is not a reason to reject the teachings of the prior art since applicant's system will inherently do the same thing assuming the oxidizer or fuel gas is contaminated with any sort of particulate matter, that any upstream filters have been unable to isolate and trap.

Finally, regarding the "common coolant" limitation in claim 1, it is clear from Getchel et al (USP 6,415,858) that precision temperature control equipment often uses a common coolant (see return pipe 116) in a thermal conditioning unit (110) that includes a cooler (134 and/or 135) and separately heated outputs 112 and 114 connected to two parts of a thermal conditioning machine requiring different temperatures. To have used such a "common coolant" type of conditioning machine to supply appropriate temperature coolant to inlet pipes 3 and 9 of Weitman (or corresponding first and second heat exchangers in the other prior art) would have been obvious to avoid the extra cost of providing two separate cooling systems.

Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over JP' 468/Weitman in view of Fleck and/or applicant's admitted prior art as applied to claim 1 above, and further in view of Ebbing et al. (5,544,275) or Othmer (3,617,699).

Heaters for long delivery pipes where significant temperature may occur are well known to prevent the condensation (or freezing) of gas components. To have used either of the heaters of Ebbing or Othmer in the outlet of the prior art to keep the outlet line from experiencing undesirable condensation problems would have been obvious.




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Claim 20 would be allowable if rewritten to overcome the rejection(s) under 35 U.S.C. 112, 2nd paragraph, set forth in this Office action and to include all of the limitations of the base claim and any intervening claims, because claim 20 clearly states the true relationship of the "common coolant" recitation vis-à-vis the first and second heat exchangers.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication should be directed to John Ford at telephone number (571) 272-4911.



**John K. Ford**  
**Primary Examiner**